n Education Strategy for Sustainable Development in Saskatchewan

SASKATCHEWAN ROUND TABLE
ON ENVIRONMENT AND ECONOMY

AN EDUCATION STRATEGY

FOR SUSTAINABLE DEVELOPMENT

IN SASKATCHEWAN

Prepared for the
Saskatchewan Round Table on Environment and Economy
by the
Round Table Education Advisory Committee
April 1992

92-06113/

Table of Contents

Recommendations 1

Introduction 2

International Context 2
National Context 3
Saskatchewan Context 3

Rationale for an Education Strategy 5
Goals and Objectives 6
Education Strategy Principles 6
Key Audiences 7

Action Plan for an Education Strategy 10

Action to implement key recommendations 10
Action to implement supporting recommendations ... 13

Summary 17

Appendices

A. Education Advisory Committee Members and Organization Diagrams 18
B. Conservation Strategy Principles 24
C. Sector Advisory Groups to Saskatchewan Round Table 25
D. Continuing Education Programs 26
E. Glossary 33
F. Acknowledgements 35
G. Recommended Readings 36

AN EDUCATION STRATEGY FOR SUSTAINABLE DEVELOPMENT IN SASKATCHEWAN

Saskatchewan Round Table on Environment and Economy

Recommendations

The Education Advisory Committee makes four key recommendations to Saskatchewan's Round Table on Environment and Economy. Together, they respond to the first two principles from the Conservation Strategy for Sustainable Development. Implemented together, they give Saskatchewan people the tools to honour the other six principles.

Key Recommendations

1. Establish an independent and permanent body to monitor and review the implementation of the Education Strategy.
2. Facilitate the development and implementation of education programs for the most senior political, educational, business and community leaders, to encourage commitment among decision makers and provide a means to demonstrate their support.

3. Establish a central, readily accessible, up-to-date and Saskatchewan-related compilation of environmental and sustainable development information.

4. Incorporate environmental education and sustainable development concepts and values into curricula and programs in formal education systems and institutions in Saskatchewan.

Supporting Recommendations

5. Incorporate environmental education and sustainable development concepts into all existing and future curricula for Saskatchewan K-12 schools.

6. Encourage all post-secondary institutions, as appropriate to their missions, to offer sustainable development education courses, to conduct research programs in environmental and sustainable development topics, and to offer professional education programs in environmental management and environmental protection.

7. Identify, promote and practice effective instructional approaches that promote environmental education during in-service education and professional development for K-12 teachers.

8. Identify and encourage development of a balanced, accurate and current collection of environmental education and sustainable development resources pertinent to the Saskatchewan and Canadian perspective, for purchase and use in Saskatchewan schools.

9. Ensure public education programs are developed and maintained to meet the continuing need for updated and additional education for environmental citizenship.

10. Through existing committees or structures where possible, provide educational programs on sustainable development within the workplace or through business, labour, professional and community organizations, to the widest audience possible. Make use of materials that already exist and which can be obtained from environmental groups, the Federation of Saskatchewan Indian Nations, government agencies and other organizations.

11. Establish incentives and recognition for agencies, communities and workplaces undertaking effective program(s) to educate for environmental citizenship and sustainable development.

Introduction

From the beginning of recorded history, there has been a reliance on the natural environment for economic well-being. Within the last two centuries, there has been a growing understanding that education about the environment is essential to its conservation. Within the last two or three decades, there has been an appreciation of the close linkage between our long-term economic health and the conservation of our environment.

People the world over are now seeking means to understand and manage the inter-dependence of the environment and the economy. This document presents a plan for action to be taken here in Saskatchewan to increase the understanding of this relationship. Its ultimate goal is *environmental citizenship*: people making decisions and setting priorities appropriate to the maintenance of a healthy environment and a healthy economy. Only through such an approach can the people of Saskatchewan practice the principles of *sustainable development*.

International context

During the past 20 years, several United Nations' environment conferences have recommended establishing international, interdisciplinary education programs. The International Environmental Education Programme was established following the 1972 Stockholm Conference. An *environmental education* framework and goals were developed from the 1975 Belgrade Charter, and strategies for *environmental education* were developed at the 1977 Tbilisi Conference.

In 1980, three international agencies jointly published the World Conservation Strategy.

(United Nations Environment Program, International Union for Conservation of Nature and Natural Resources, World Wildlife Fund). Through that strategy, these organizations strongly endorsed *sustainable development* and defined goals for national and provincial conservation strategies.

Subsequently, the United Nations established the World Commission on Environment and Development, commonly known as the *Brundtland Commission.* (Chairperson Dr. Gro Harlem Brundtland was then Norway's Environment Minister, and is now Prime Minister). In 1987, the Commission released its report, Our Common Future, after three years of public hearings and written submissions. The report highlighted the universally applicable inter-relationships between humans and their environment. It examined the interaction between human population, food security, species, ecosystems, energy, industry and urban development. It related those elements to the global environment's ability to sustain human life.

The Brundtland Report introduced a widely-accepted definition of *sustainable development.* It was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

National Context

Following the Brundtland Commission's 1986 hearings in Canada, the Canadian Council of Resource and Environment Ministers established a National Task Force on Environment and Economy. The Task Force's 1987 report recommended national, provincial and territorial Round Tables on the environment and the economy. Those Round Tables were appointed in 1988 and 1989. In 1991, the National Round Table prepared a report entitled The Sustainable Development Education Program for presentation to the Council of Ministers of Education, Canada (CMEC).

In 1990, Canada published its national program, known as the Green Plan, to achieve sustainable development. The Green Plan describes *sustainable development* as "...activity in which the environment is fully incorporated into the economic decision-making process as a forethought, not an afterthought."

Canada's Green Plan calls for nation-wide environmental information and awareness programs. Public participation documents used to prepare the plan contain many recommendations for information and education programs to increase public understanding of the human impact on our environment. These Green Plan awareness programs are intended to develop *environmental citizenship* -- an understanding and consideration for the environmental impact of all human activities. Thus there is a place for both national environmental awareness programs and provincial education strategies for sustainable development.

Saskatchewan Context

Appointed in 1989, Saskatchewan's Round Table was charged with the responsibility for developing a provincial Conservation Strategy for Sustainable Development. To ensure practical, knowledgeable input to this process, the Round Table appointed Advisory Groups from eleven economic sectors. The sector advisory groups are listed in Appendix C. Each of the eleven sector advisory groups identified education about sustainable development as being *essential* for the implementation of any provincial plan.

Knowledge about the environment and an understanding of the intricate relationship between it and the economy are necessary for the people of the province to make wise decisions and choices.

In response to those reports, Saskatchewan's Round Table on Environment and Economy appointed the *Education Advisory Committee* in March of 1991. The committee's mandate was to recommend an education strategy that will support the implementation of the Conservation Strategy for Sustainable Development in Saskatchewan.

The Committee was representative of Saskatchewan's educational institutions and organizations, provincial and municipal agencies, wildlife and environmental interest groups, agriculture, business and industry. Through this broad representation it was able to identify potential learning opportunities for all Saskatchewan citizens, whatever their role in the community, workplace or home.

The Education Advisory Committee thoroughly reviewed the eleven sector advisory reports presented to the Round Table, and examined the existing educational programs and resources, both formal and informal. It also identified learning needs and opportunities within and beyond the formal education systems. Five subcommittees studied the specific needs and opportunities in their assigned areas, and developed recommendations for the education strategy. The subcommittees were:

Formal Education - considered goals, curricula, instruction, resources and monitoring for K-12 and post-secondary education in Saskatchewan.

Continuing Education - considered informal and alternate learning opportunities not now in the formal system; potential learner groups; potential program goals, content, vehicles and facilitators.

Media - considered the media's special role and potential in affecting public attitudes, media-information resources, information-dissemination processes, and reciprocal or shared communication responsibilities.

Labour/Industry/Agriculture - considered motivation, structure(s), responsibility, incentives and rewards, resources, processes, application, and monitoring within the agriculture, business and industrial sectors.

Public Sector - considered roles and responsibilities, target groups, applicable learning opportunities, processes, resources and monitoring within governmental and aboriginal agencies.

The Education Advisory Committee then developed its recommendations for an education strategy by combining information from the sector advisory group reports, Education Advisory Committee subcommittee reports, and additional information from other relevant documents. A diagram of organizational relationships and information flow appears in Appendix A on page 22.

Education Strategy Rationale

The term *sustainable development* describes a balancing process.
It requires screening all projects to ensure the environment is conserved. It implies adapting and adopting activity that meets our current needs without damaging or depleting resources future generations will need. Their economic health will depend on the quality of the environment this generation leaves them.

In our day-to-day activities, we all make decisions that affect the environment. The impacts of those decisions must be fully understood. Business, community, political and labour leaders must be expected to understand the environmental impact of their economic decisions and to balance economic and environmental factors. Decisions fostering sustainable development will contribute to long-term economic and environmental viability. People around the world are now seeking ways to apply sustainable development principles to all their activities to ensure present and future economic and environmental health. Environmental citizenship -- and the wise decisions implied -- requires knowledge. This document outlines how we can accomplish widespread education for sustainable development in Saskatchewan.

The educational system's curriculum now includes some environmental material. However, a more fully-developed approach to sustainable development education is needed to equip today's youth for wise decision-making in the future. Environmental education concepts are adaptable to education for sustainable development.

The following adapted definition is based on the Belgrade Charter, and Buetler's article, "Environmental Education: Making the Future More Promising" (published in NASSP Curriculum Report 17[3], January 1988):

> *Environmental education - balances curiosity about and respect for the ecosphere, imparts knowledge about its components, their dynamic interactions, and human influences on these. It is an interdisciplinary, holistic process by which learners:*
>
> - *develop awareness of the natural and constructed environment*
> - *develop knowledge of how the environment works*
> - *acquire knowledge of the technological, social, cultural, political and economic relationship occurring in environmental issues*
> - *develop active inquiry and problem-solving skills, and appropriate values to guide behaviour in dealing with environmental issues*
> - *become motivated to apply action strategies that help protect and sustain the environment's integrity.*

Goal and Objectives

The Education Strategy supports the Conservation Strategy for Sustainable Development developed by the Saskatchewan Round Table, and is essential for its implementation. The strategy is an action plan for implementing and maintaining sustainable development through education. It recommends appropriate existing or new education directions, resources and means. It promotes learning and widespread understanding, acceptance and application of the principles of sustainable development.

This strategy has one clear, simple goal: to *promote environmental citizenship through education.*

These objectives will help attain that goal:

- Create *informed commitment* among political, economic and social decision-makers to carry out and maintain sustainable development.
- Ensure *access to learning opportunities and information sources* for citizens in urban, rural, northern and aboriginal communities.
- Create a *widespread understanding* of the relationship between environmental conservation and a viable economy within individual communities.
- Promote continuing *practice and maintenance* of sustainable development principles and environmental citizenship.

Principles for the Education Strategy

The Education Advisory Committee adapted the widely-accepted basic principles of environmental education currently used in our educational system into four basic concepts applicable to education for sustainable development.

1 *Content and scope* -
Education for environmental citizenship permits understanding nature's life systems, their inter-relationships, and results of human intervention or impact. All formal education subjects should include education for environmental citizenship. Education should permit learner-participation activities, and develop individual skills and interests.

2 *Access and opportunity* -
Effective environmental citizenship requires access to timely and relevant education and to information resources necessary to practice environmental citizenship in all roles and activities. All members of the community need access.

3 *Information relevancy* -
Effective education for environmental citizenship requires current, accurate, and balanced information, regularly updated and distributed to all users. Information must be relevant to the community of users.

4 *Effect* -
Effective education for environmental citizenship empowers learners to assume personal responsibility for informed decisions and action to balance lifestyles with environmental stewardship.

Key Audiences for the Education Strategy

It is intended that all Saskatchewan people, whatever their roles, acquire a working understanding of sustainable development. This task is urgent. It is recommended that education begin with several key audiences, who in turn will be responsible for implementing education programs for others in their sector. Thus the key audiences have a dual role: as learners and as leaders or facilitators.

- *Leaders and decision-makers*

Education for sustainable development must begin at the highest levels to demonstrate the full commitment and support of community leaders. Representatives elected to public office are responsible for government and organization policies that reflect the public will. Their highly visible activity influences public opinion. Appointed officials and public service employees throughout governmental and aboriginal agencies can also influence public opinion as they implement policies and programs. Their visible endorsement of sustainable development principles should set the stage for public acceptance of education for sustainable development. Senior executives and managers of corporations and labour organizations determine our approach to economic development and similarly influence public attitudes and behaviour.

Leaders and decision-makers include people elected or appointed to federal, provincial and municipal governments, leaders of aboriginal organizations, and boards of educational or health-care institutions. Also included are leaders in agriculture, transportation and energy, construction, resource and manufacturing industries, tourism, consumer and conservation groups.

Federal - Members of Parliament from Saskatchewan, regional directors of departments, program managers, district heads, administrators

Provincial - Premier and cabinet ministers, MLAs, deputy and associate deputy ministers, executive directors, department heads, administrators

Cities - Mayors and councillors, city commissioners, division managers, department heads, administrators

Towns and villages - Mayors and councillors, town administrators, managers

Rural municipalities - Reeves and councillors, RM administrators

Aboriginal agencies - Organization Chiefs or presidents, tribal councils, band chiefs and councillors, executive directors, managers and directors, administrators

Education/health - Boards or senates for education systems and institutions and health-care institutions; executive officers, administrators, managers, professional or industry associations

Industry/corporate sectors - Boards of directors, executive officers, administrators, managers, professional or industry associations

Non-government organizations - Directors, executive officers, administrators

• *Adults outside the formal education system*

A wide range of continuing learning opportunities is essential to implement Saskatchewan's Conservation Strategy in both the short and medium terms. In its broadest sense, continuing learning describes the process of adults learning throughout their lives.

The largest group of Saskatchewan people -- adults outside the formal education system -- will need to learn about sustainable development in continuing learning situations. The range of learning opportunities, teaching vehicles and locations will be as broad as the task at hand. Agencies and organizations currently offering educational opportunities include: government and non-government organizations, libraries, national and provincial parks, community groups, churches and the media.

The Education Advisory Committee assessed practical applications of education for sustainable development. Appendix D summarizes a cross-section of learners, program goals and content. Also suggested are vehicles for delivering the programs. The list is not exhaustive, but it offers direction to those who implement the education strategy.

• *Workplace learners*

The workplace is a logical place to reach several hundred thousand Saskatchewan people with the sustainable development message. Programs can be tailored to suit both learners' needs and specific sustainable development requirements of their workplace. Most workplaces already have formal or informal structures (such as personnel offices or occupational health and safety committees) that can serve as either models or vehicles for establishing sustainable development education programs.

From the sector advisory group reports and consultations with both management and labour, the Education Advisory Committee developed criteria for workplace education for sustainable development.

- Programs must be sufficiently *broad and flexible* to address universal issues as well as emerging situations specific to a workplace.
- Programs must *address both advantages and drawbacks* of applying sustainable development principles in specific workplaces.
- Programs must *accommodate the learning needs of employees, management and customers,* in all sizes of business and industry.
- Programs must *incorporate incentives* and motivation to continue education for sustainable development either in or away from the workplace.

Business and professional associations and labour organizations have a responsibility to play a key role in workplace education programs. Motivation, support and incentives will demonstrate leadership in encouraging workplace education for sustainable development.

- *Media*

The communications media play a major role in developing public awareness and informing public opinion. The information and interpretations provided play a primary role in shaping public opinion and attitudes.

Public awareness and understanding of sustainable development principles can be greatly enhanced through the media. By exploring the relationships between economic and environmental impacts of events and activities they provide their audiences with the message that sustainable development is important.

Education about sustainable development must begin with editorial boards, management, administration, news and feature editors, and reporters and broadcasters.

- *Educators and students*

The many good programs already in place in our schools provide us with a starting place for building new ones. Saskatchewan has long accepted the need for *environmental education*. Its concepts are incorporated in new school curricula and in teacher education programs at both universities. Many groups have given *environmental education* a focus within the system, providing resource publications and annual conferences.

The growing participation of youth in environmental action groups provides a strong indication of the system's current effectiveness in developing an environmental awareness. We must now place our understanding of economic needs alongside this awareness. The environmental costs of developments and their long-term impacts must be understood along with short and medium-term needs and benefits.

Action Plan for an Education Strategy

This sustainable development education strategy cannot achieve its full potential unless two essential criteria are met from the beginning.

- The strategy needs *all decision-makers' agreement and active commitment* to create appropriate policies, processes and tools that will achieve sustainable development.

- The body responsible to bring about the education strategy must *adopt and implement all four principal recommendations.* Each depends on the others to achieve its purpose.

Action to Implement Key Recommendations

1. *To the Round Table:*

   Establish an independent and permanent body to monitor and review the implementation of the Education Strategy.

   With any major initiative or ongoing activity, periodic monitoring or review with subsequent adaptation of the process to meet changing conditions are required if the enterprise is to be successful. For sustainable development, it is important that this activity be carried out by a body that is and is seen to be independent of partisan or parochial interests. The body's responsibilities must also include development of a detailed action plan, with an annual update, to carry out the Education Strategy. This body could be the one recommended in the first recommendation in the Conservation Strategy for Sustainable Development.

   Action

   • Ensure the implementation body is charged with the responsibility to report on progress to appropriate agencies, but that it operates at arm's length from government departments.

   • Give the implementation body these major responsibilities:

   - Coordinate and implement the Sustainable Development Education Strategy for all Saskatchewan citizens.
   - Monitor education program management and progress towards meeting strategy objectives, through liaison with education-providing agencies, local committees or organizations.

- Identify new or developing learning opportunities for Saskatchewan citizens.
- Recommend to appropriate agencies new ways to improve public awareness and understanding of sustainable development.
- Monitor the central information resource's service and use.
- Investigate and monitor funding resources as well as sustainable development incentives and rewards.
- Work with government and other policy-making agencies.

2. *To the implementation body:*

Facilitate the development and implementation of education programs for the most senior political, educational, business, and community leaders, to encourage commitment among decision makers and provide a means to demonstrate their support.

Widespread public participation in sustainable development programs will be greatly facilitated should acknowledged decision-makers learn about, promote and support the principles and programs in their own organizations. Achieving sustainable development will ultimately depend upon the awareness and support of every citizen.

Action

• Through the implementation body, facilitate the development and presentation of programs on sustainable development to the Premier and Cabinet, and immediately thereafter to other key political, educational, business and community leaders.

• Encourage the involvement of the leaders in the determination of the content and delivery of education programs for others in their respective organizations.

• Follow the leaders' education programs with education programs for others in their respective organizations, to demonstrate leaders' support for and commitment to the application of sustainable development principles in their agency or organization.

3. *To the implementation body:*

Establish a central, readily accessible, up-to-date and Saskatchewan-related compilation of environmental and sustainable development information.

A central source of information on environmental and sustainable development concepts is needed by educators and students, media personnel, business and political leaders, special-interest groups, and the public. An up-to-date and readily accessible resource would provide reliable information on which to base work and decisions.

Action

• Through an appropriate public agency, such as a provincial government department, establish an official, central information resource for access by all Saskatchewan people, free of charge.

• Co-ordinate or consolidate the central information resource with already existing resources, such as those available through the Saskatchewan Environmental Society, and Saskatchewan Environment and Public Safety.

• Ensure the information contained is up-to-date about environmental and economic issues, sustainable development concepts, relevant events and activities, proponents and expert spokespeople, goals and achievements.
• Establish network contact or liaison with business and industry, and with economic and environmental information resources elsewhere in North America. Two-way information exchange will expand the resources available to users, and provide easy access to Saskatchewan-based information to users in other jurisdictions. Use existing networks such as those already established by the Canadian Council of Ministers of the Environment and CMEC.
• Establish an immediate-response policy for communications media information requests, enabling them to meet publication or broadcast deadlines.
• Ensure that information is available in format(s) appropriate to the various users to maintain the official information resource's credibility with users. Educators, media, labour and management, researchers, have different information-format needs which must be met within a time-frame suited to users' needs.
• Establish ready electronic access to summary-form information for media newsrooms' use.
• Ensure the information resource includes current information on many viewpoints about environmental education, environmental issues and sustainable development topics. It should also include lists of key experts or spokespeople available for media interviews. The experts could also be part of a speakers' bureau.

4. *To Saskatchewan Education and all formal education institutions in Saskatchewan:*

Incorporate environmental education and sustainable development concepts and values into curricula and programs in formal education systems and institutions in Saskatchewan.

Today's students are future leaders, decision-makers, and consumers. They must understand the complex relationships between the environment and the economy if they are to maintain a healthy environment and viable economy for themselves and future generations.

Action
• Ensure, through existing curriculum development agencies and formal education institutions, that sustainable development and environmental education concepts are incorporated into curricula and programs by the end of 1999.
• Monitor progress on this recommendation through the implementation body.

Key Recommendations' Importance

The Education Advisory Committee emphasises the importance of adopting all four key recommendations. Each relies on all the others for stability, wholeness, and successful performance. Together, these four recommendations respond to the first two principles from the draft Conservation Strategy for Sustainable Development, and give us the tools to honour the other six.

Action to Implement Supporting Recommendations

5. *To Saskatchewan Education and all educational institutions:*

Incorporate environmental education and sustainable development concepts into all existing and future curricula for Saskatchewan K-12 schools.

These concepts should be included in curricula on all other topics. If this is done, a special curriculum on sustainable development will not be necessary.

Action

- Continue and strengthen integration of key environmental education and sustainable development concepts, processes and skills, and affective abilities into every K-12 subject.
- Emphasize environmental education and sustainable development in resource-based learning and materials.
- Pursue private and public funding sources to develop program resource materials for schools.
- Provide equal opportunity in all schools for access to environmental education and sustainable development teacher training, programs, information and support services.

6. *To universities, technical colleges and other post-secondary educational institutions:*

Encourage all post-secondary institutions, as appropriate to their missions, to offer sustainable development education courses, to conduct research programs in environmental and sustainable development topics, and to offer professional education programs in environmental management and environmental protection.

Action

- Encourage Saskatchewan's post-secondary institutions to develop and offer certificate, diploma, or degree programs in sustainable development.
- Encourage all post-secondary institutions to require all students to take at least one sustainable development course.
- Encourage Saskatchewan universities to further develop research in ecologically and socially sustainable development.
- Encourage post-secondary institutions to require all teachers-in-training to take an environmental education methods course.
- Encourage schools of journalism and communications to require students to take a course on ecologically and socially sustainable development applicable to journalistic reporting.
- Encourage Saskatchewan's post-secondary education institutions to further develop and offer certificate, diploma and degree programs in environmental management, environmental protection and sustainable development.

7. *To Saskatchewan Education, Directors of Education:*

Identify, promote and practice effective instructional approaches that promote environmental education during in-service education and professional development for K-12 teachers.

Action

- Implement instructional models, strategies, methods and skills already identified in Saskatchewan Education's 1991 publication Instructional Approaches: A Framework for Professional Practice.
- Encourage support for the inclusion of environmental education as a required component of teachers' professional development from the formal educational partners.

8. *To Saskatchewan Education, Boards of education, educational publishers:*

Identify and encourage development of a balanced, accurate and current collection of environmental education and sustainable development resources pertinent to the Saskatchewan and Canadian perspective, for purchase and use in Saskatchewan schools.

Action

- Cooperatively with Saskatchewan schools, identify and allocate adequate human and financial resources to:
  - establish criteria
  - assess existing materials
  - encourage development of new materials as required to provide balance and accuracy and reflect contemporary knowledge
  - promote the collection's acquisition and use in schools
  - maintain and update the collection regularly
  - evaluate its use within Saskatchewan's formal education system.
- Share established criteria for the resource collection with schools and school districts so they can augment their basic collection.

9. *To implementation body and all agencies with public or workplace education programs:*

Ensure public and workplace education programs are developed and maintained over time to meet the continuing need for updated and additional education for environmental citizenship.

Action

- Ensure that public and workplace education programs include plans for presenting new, up-dated or additional information.
- Ensure that the implementation body monitors both initial public and workplace education programs and continuing program follow-up opportunities.
- Encourage incorporation of industry-specific sustainable development information into staff and on-the-job training and professional development programs.
- Encourage business and professional associations to routinely include education for sustainable development in conferences, workshops and seminars in the foreseeable future.
- Encourage business and professional associations to pursue and present sustainable development information in their industry, association or professional publications.

10. *To implementation body, and all agencies with public or workplace education programs:*

Through existing committees or structures where possible, provide educational programs on sustainable development within the workplace or through business, labour, professional and community organizations to the widest audience possible. Make use of materials that already exist and which can be obtained from environmental groups, the Federation of Saskatchewan Indian Nations, government agencies and other organizations.

Action

- Design education and awareness programs based on each of the Conservation Strategy's eight objectives, as well as the broad concepts and principles of sustainable development.
- Ensure that programs demonstrate practical application of the Conservation Strategy objective(s).
- Ask environmental interest groups to participate in these educational programs.
- Design program(s) to incorporate means to evaluate learning and progress in achieving objectives.
- Encourage, wherever possible, use of existing structures or committees to deliver public or workplace environmental education. (Occupational Health & Safety is a good model).
- Take appropriate steps to permit Occupational Health and Safety committees to assume the environmental education function.
- Ensure that public and workplace education plans and programs are reported to the implementation body.

11. *To implementation body:*

Establish incentives and recognition for agencies, communities and workplaces undertaking effective program(s) to educate for environmental citizenship and sustainable development.

Action

- Establish clear criteria for satisfactory, effective public and workplace education programs for sustainable development, and distribute or publicize them at appropriate times.
- Develop workplace-related, positive incentives such as tax breaks or permit-fee reductions (rather than penalties for non-compliance).
- Expand and refine the Round Table's existing Environmental Awards Program to recognize and reward exemplary achievements in workplace sustainable development education.
- Annually compile and appropriately publicize a list of the top Saskatchewan employers undertaking effective sustainable development education programs.

Appendices

A. Education Advisory Committee Members and Organization Diagrams
B. Conservation Strategy Principles
C. Sector Advisory Groups to Saskatchewan Round Table
D. Continuing Education Programs
E. Glossary
F. Acknowledgements
G. Recommended Readings

Summary

A sustainable future is possible in Saskatchewan if its citizens take personal responsibility for understanding the principles of sustainable development and for applying them in their own daily activities. The understanding of the relationship of the environment and economy depends on the continuing education of all of us.

The plan outlined in preceding pages calls for urgent, new action for the people of Saskatchewan. We must move immediately to educate all citizens, regardless of age, and to enlist their participation in our on-going efforts for sustainable development. Cooperation, involvement and support from community leaders and organizations will be needed. The recommendations contained in this report recognize and anticipate such leadership and participation.

The plan also recognizes and endorses a considerable amount of action already under way. Wherever possible, it attempts to make use of existing materials, models or structures for easier program implementation. Throughout, it stresses that understanding the economy-environment interrelationships will be a continuous process, not just a one-time exercise.

Students now enroled in Saskatchewan's formal education system are being provided an opportunity to appreciate and understand sustainable development. From their ranks will come the province's future leaders and decision makers, aware of the complex relationships between our economy and our environment. Their knowledge and understanding will ensure a sustainable future. It is not possible, however, to wait for these students to take on their ultimate responsibilities in our society.

The Round Table's Conservation Strategy for Sustainable Development defines what we need for a sustainable future. This Education Strategy identifies a means for achieving that end. Our success will be measured in the legacy we leave future generations -- a healthy planet.

Appendix A

Education Advisory Committee

to Saskatchewan Round Table on Environment and Economy

Chairman
Dr. Donald O. Wells
University of Regina
- President, Vice Chancellor and Professor of Physics at the University of Regina
- Formerly with Mount Allison University, University of Manitoba and University of Oregon
- Formerly research scientist and consultant - Lockheed Missile and Space Division in California
- BSc, MSc and PhD in physics from Stanford University
- Recognized consultant in university administration

Lynn Anderson
Saskatchewan Science Teachers' Society
- Past President, Saskatchewan Science Teachers' Society
- 18 years experience in environmental education - Bert Fox High School, Fort Qu'Appelle
- Fellow - Shell Merit Summer Institute (SEEDS); Fellow - Northern Telecom Institute for Teachers

Margret Asmuss
Saskatchewan Environmental Society
- Writer and adult education consultant
- Honours BA (French, English) Master of Continuing Education - University of Saskatchewan
- Board member since 1965 - Saskatchewan Environmental Society
- Former librarian, project manager and liaison officer for SES
- Active in cooperatives and community development
- Rural resident with special interest in relationship between community development and environmental sustainability

Richard Bonokoski
Saskatchewan Institute of Applied Science and Technology
- Principal, SIAST Wascana Campus
- 14 years' experience in adult education - Regina Plains Community College and the Saskatchewan Literacy Campaign
- Member - the Canadian Association for Adult Education
- Former member - Minister's Advisory Committee on College Finances (1986-87); Provincial Advisory Committee on Adult Basic Education (1980-1986)
- BA - University of Western Ontario; PGD - Continuing Education - University of Saskatchewan.

Todd Brandt
Meewasin Valley Authority
- Program Development Manager - Wanuskewin Heritage Park
- Author and lecturer on environmental education, interpretation, experiential education and heritage
- Member - Interpretation Canada and Conservation Educators Resource Group
- Former executive member - SOEEA
- Former WWF Operation Lifeline provincial facilitator
- Honours baccalaureate in biology

Peggy Brunsdon
Museum of Natural History
- Supervisor of Education - Museum of Natural History
- Former educator - Office of Energy Conservation; National Museums of Canada; Western Development Museums
- Member - Advisory Committee for Social Studies Curriculum
- Member - Museums Association of Saskatchewan

John Derbowka
Saskatchewan Committee on Rural Area Development
- Chairman - Saskatchewan Committee on Rural Area Development (SCRAD) -- a coalition of organizations and institutions involved with rural development education
- 20 years representing Saskatchewan Wheat Pool on numerous provincial and community boards and committees
- Graduate - St. Joseph's College; University of Saskatchewan; the former Cooperative College of Canada

Les Ferguson
Saskatchewan Indian 4H Program
- Member - Saskatchewan 4-H Council and Board of Directors
- 19 years' experience - Saskatchewan Indian Agriculture 4-H program leadership
- Former member - Development Education Committee for the Saskatchewan Council for International Cooperation.
- BA, Education Diploma, PGD - Educational Psychology, MEd - Educational Psychology - University of Saskatchewan

Lin Gallagher
Saskatchewan Parks and Renewable Resources
- Natural Environment Program specialist with Saskatchewan Parks and Renewable Resources
- Heritage interpretation specialist - federal and provincial governments
- Author and lecturer on environment and natural history
- Executive member - Central Region Interpretation Canada
- Former chairperson - Saskatchewan Museums Association interpreters' interest group.
- BSc in Biological Sciences

Rosanne Glass
Family Foundation, Government of Saskatchewan
- Manager - Education and Extension, Saskatchewan Family Foundation
- Former instructor - Saskatchewan Indian Federated College; University of Regina
- BA - Anthropology, BEd

Dr. E. Paul Hart
Faculty of Education, University of Regina

- Professor - Science/Environmental Education, University of Regina
- Director of the Saskatchewan Instructional Development and Research Unit, Faculty of Education, University of Regina
- Member - UNESCO-Canada's Man and the Biosphere Education Network, Regina Urban Environment Advisory Committee, local education and environmental organizations
- Member - Board of Directors, North American Association for Environmental Education
- Author and lecturer on environmental/science education at several western Canadian universities
- BSc - Honours Biology; BEd, MEd and PhD in Science and Environment Education

Linda Jaine
University of Saskatchewan

- Coordinator of Indigenous Peoples Program, Extension Division, University of Saskatchewan
- Former lecturer and Associate Department Head for Indian Studies, University of Saskatchewan
- Former lecturer - Saskatchewan Indian Federated College
- Internationally recognized author and lecturer on cross-cultural, women's and Indigenous issues
- BA, LLB and PGD - University of Saskatchewan

Peter Jonker
University of Saskatchewan

- Coordinator of Environment, Science and Technology programs - Extension Division, University of Saskatchewan
- Author - several books and articles on the environment
- MSc - Wildlife and Recreation (Interdisciplinary), University of Calgary

Barry Mitschke
Saskatchewan Education, Government of Saskatchewan

- Director, Mathematics and Natural Sciences Branch, Curriculum and Instruction Division, Saskatchewan Education
- Responsible for Core Curriculum development
- Former science teacher and department head - Robert Usher Collegiate, Regina
- Former president - Saskatchewan Science Teachers' Society
- Former president - Saskatchewan Outdoor and Environmental Education Association
- Fellow - Shell Merit (SEEDS)
- BA (Biology and chemistry), BEd, MEd - University of Regina

Dick Nieman
Saskatoon Catholic School Division

- Superintendent of Education - Saskatoon Catholic Board of Education
- 25 years' experience as teacher, principal and coordinator of educational media
- Chairman - Education Advisory Committee, Meewasin Valley Authority
- Member - Visitor Services Committee, Wanuskewin Heritage Park
- Former president - Catholic Family Services
- Former vice-president - United Way of Saskatoon

Earle Robertson
Saskatchewan Teachers' Federation
- Science program coordinator - Marian Graham Collegiate, Saskatoon
- 24 years as teacher and administrator - Saskatoon Public Schools
- Member - Saskatchewan Education's physics curriculum committee (15 years)
- Executive member - Saskatchewan Teachers' Federation and STF curriculum advisory committee
- Hilroy Fellowship Award - 1975

Marilyn Scott
Saskatchewan School Trustees Association
- Chairperson - Saskatchewan School Trustees Association, Northern Branch
- Board member - Northern Lights School Division, Northern Teacher Education Program (NORTEP) Council
- Member - La Ronge and District Economic Development Committee
- Business Administration graduate - Prince Albert Technical School

Roy Sonderhausen
Saskatchewan Outdoor & Environmental Education Association
- Science teacher - Saskatoon Catholic School Division
- Past President - Saskatchewan Outdoor and Environmental Education Association
- Member - Blackstrap Outdoor School Advisory Committee
- Project Wild facilitator and representative
- BSc, BEd - University of Saskatchewan
- Bates Award - 1986

The three people listed at the right also served brief terms on the Education Advisory Committee.

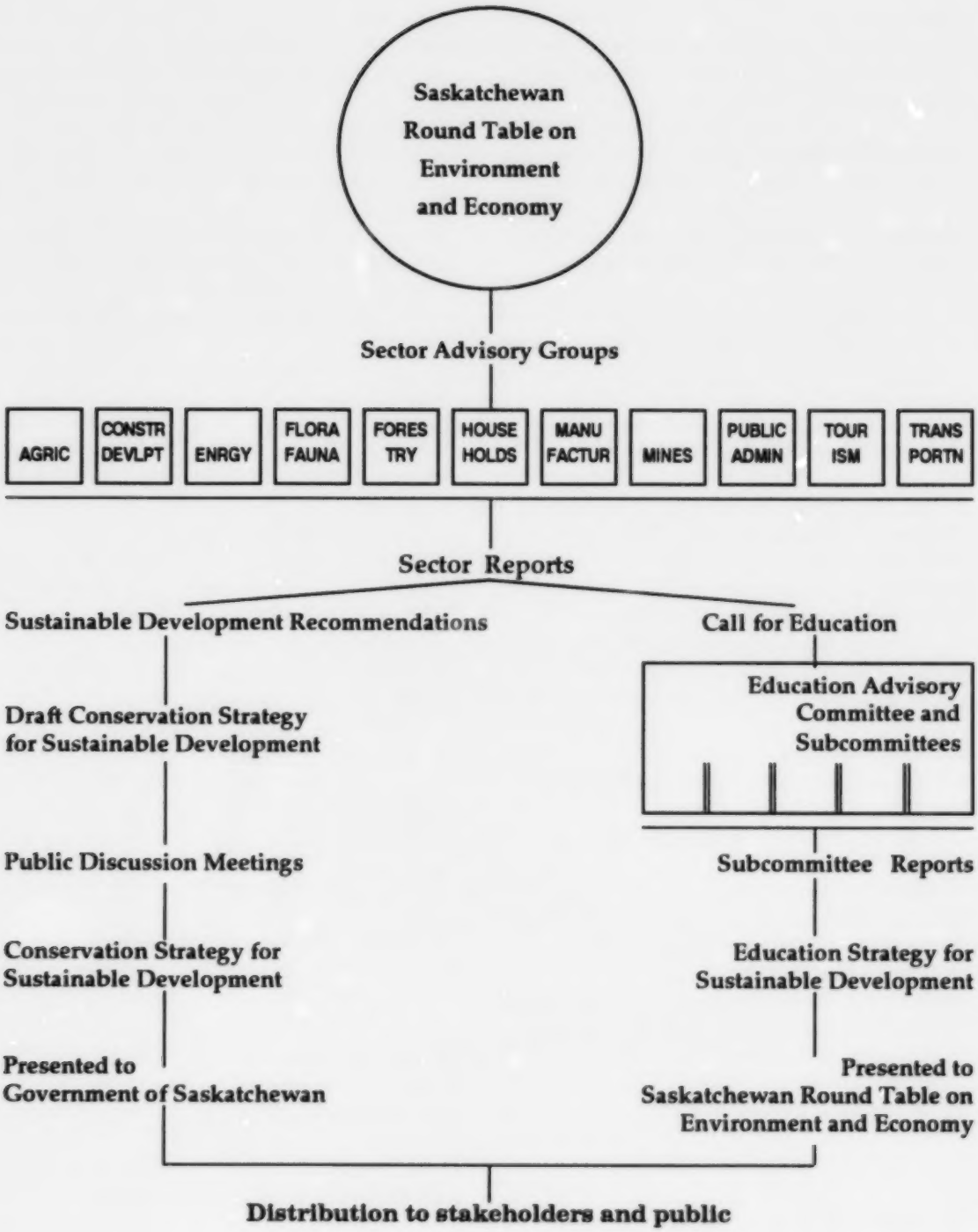
Linda Weigl
Weigl Educational Publishers Limited
- President - Weigl Educational Publishers
- 16 years in curriculum development, publishing and consumer education
- Former consumer education consultant - Government of Alberta, Government of Saskatchewan
- Former instructor - University of Regina, and high school teacher - Miller Comprehensive High School, Regina
- BA, BEd - University of Regina

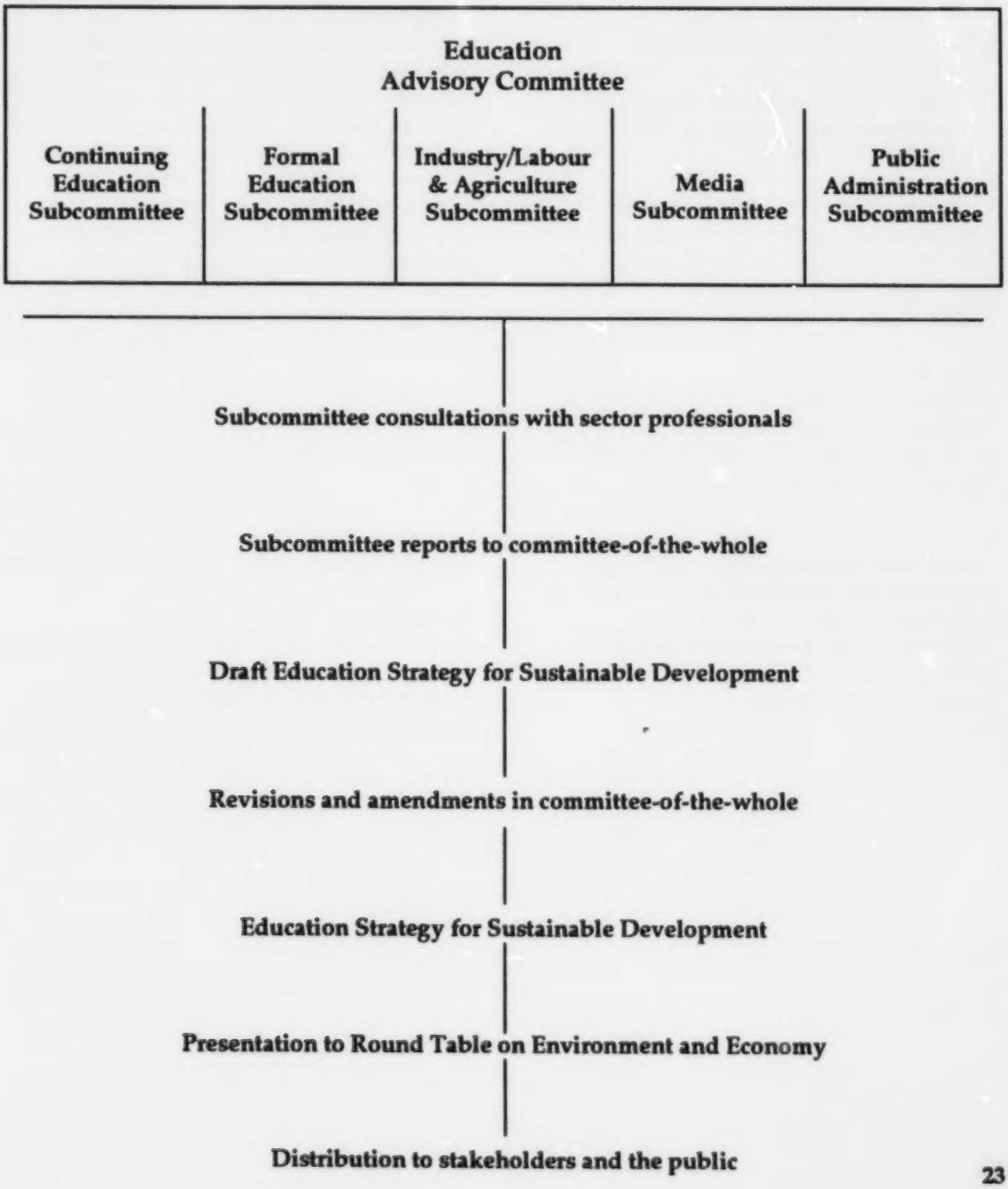
Larry Young
Greenall High School, Balgonie
- Physics/biology teacher - Greenall High School, Balgonie
- 30 years' experience in science and environmental education
- Sessional lecturer - University of Regina, and Cooperating Teacher (Biology) with U of R teacher internship program
- Past President - Saskatchewan Teachers' Federation, Saskatchewan Science Teachers' Society, Canadian Association of Science Teachers
- Member - many provincial, national and international groups involved with the sciences, educational technology, and curriculum development, and the Heart and Stroke Foundation of Saskatchewan and of Canada.

Gillian McCreary
Family Foundation, Government of Saskatchewan

Dave Stuart
Saskatchewan Wildlife Federation

James Yuel
Saskatchewan Chamber of Commerce


Saskatchewan Round Table on Environment and Economy
Sector Advisory Groups
AGRIC
CONSTR DEVLPT
ENRGY
FLORA FAUNA
FORES TRY
HOUSE HOLDS
MANU FACTUR
MINES
PUBLIC ADMIN
TOUR ISM
TRANS PORTN
Sector Reports
Sustainable Development Recommendations
Call for Education
Draft Conservation Strategy for Sustainable Development
Education Advisory Committee and Subcommittees
Public Discussion Meetings
Subcommittee Reports
Conservation Strategy for Sustainable Development
Education Strategy for Sustainable Development
Presented to Government of Saskatchewan
Presented to Saskatchewan Round Table on Environment and Economy
Distribution to stakeholders and public


Education
Advisory Committee
Continuing Education Subcommittee
Formal Education Subcommittee
Industry/Labour & Agriculture Subcommittee
Media Subcommittee
Public Administration Subcommittee
Subcommittee consultations with sector professionals
Subcommittee reports to committee-of-the-whole
Draft Education Strategy for Sustainable Development
Revisions and amendments in committee-of-the-whole
Education Strategy for Sustainable Development
Presentation to Round Table on Environment and Economy
Distribution to stakeholders and the public

Appendix B

Principles for a Conservation Strategy

from Conservation Strategy for Sustainable Development

1 *Environmental/Economic Reality*
Physical, chemical and biological characteristics limit the planet's capacity for development. Human activity and development must protect or enhance all environmental elements.

2 *Environmental/Economic Integration*
Interdependence between human activity and environmental quality demands that we respect nature's limitations in all our economic or development activity.

3 *Adaptability*
Biological diversity, flexibility and resilience are critical to all species' survival, and environmental health. We must preserve that diversity.

4 *Renewability*
Renewable resources can supply our materials and energy needs, providing we limit use to their capacity for replenishment. Resource reuse and recycling will help reduce renewable resource consumption.

5 *Efficiency*
Conducting economic activity efficiently will limit or reduce its environmental impact. Environmental protection costs less in time, energy and funds than restoration.

6 *Stewardship*
We hold our planet and its resources in trust for future generations. We must consider their needs, and leave them a healthy environment to support their existence.

7 *Sufficiency*
We must rank resource share for economic activity according to real needs rather than wants.

8 *Accountability*
We are all responsible for humanity's effect on the environment, and for its degradation or health. Education, communication and new social institutions can foster public awareness, attitude change, and positive individual and community action.

Appendix C

Sector Advisory Groups

to Round Table on Environment and Economy

In May, 1990, the Round Table established eleven sector advisory groups. They were charged with examining the implications of sustainable development within their sector, and recommending what was necessary to achieve it. The Round Table received reports from the sectors in early 1991. Information from the sector reports was used to prepare the draft Conservation Strategy for Sustainable Development released to the Saskatchewan public for review and input in September, 1991. More than 160 people were involved in these advisory groups. They represented:

- Agriculture
- Construction and Development
- Energy
- Flora and Fauna
- Forestry
- Households
- Manufacturing
- Mining
- Public Administration
- Tourism
- Transportation

Appendix D

Continuing Education Programs

The Continuing Education subcommittee presents examples of programs that could help Saskatchewan people understand and implement sustainable development principles. They are based on the Round Table's draft Conservation Strategy for Sustainable Development, education-related recommendations from the Round Table's eleven sector advisory groups, and Education Advisory Committee recommendations.

A. GENERAL PUBLIC

Learner - consumers in general
CE goal - facilitate technology transfer
CE content - new technology related to transportation which helps reduce and/or eliminate environmental degradation; for example automobile accessories
Delivery vehicle - workshops, media
Delivery agents - universities, technical colleges, extension programs, local interest groups, NGOs

Learner - general public
CE goal - to keep people abreast of the status of our environment from year to year
CE content - results of ongoing environmental monitoring
Delivery vehicle - government-established *Saskatchewan Environmental Council* (recommended by the Manufacturing Advisory Group Report)
Delivery agents - State of the Environment Report, churches, NGOs

Learner - general public
CE goal - to motivate and help people understand how each individual's consumer and lifestyle choices directly impact our environmental health
CE content - description of commercial and industrial feed-back loops to the consumer, and how these can be exploited to effect environmental healing and health
Delivery vehicle - environmental action booklet, posters, speakers
Delivery agents - schools, universities, local interest groups, churches, libraries

Learner - general public
CE goal - to develop understanding of the relationship between environmental quality and economic health
CE content - relationship between environment and economy
Delivery vehicle - written material, media discussion forums, audio-visual media (videos)
Delivery agents - universities, local interest groups, NGOs

Learner - general public
CE goal - encourage the 4 Rs for resources used at home and at work
CE content - environmental audit, alternate garbage disposal routes, garbage analysis demonstrations
Delivery vehicle - public speaker forums, media forums, media spots, flyers
Delivery agents - universities, small entrepreneurs, local interest groups, churches, libraries, government

Learner - general public, economists, all sectors
CE goal - learn the ultimate implications to sectors of our economy in changing to truly sustainable resource utilization
CE content - implications of stopping use of all non-renewable resources, and exercising fiscal limits of renewable resource harvest
Delivery vehicle - conferences, workshops, audio-visual media (videos)
Delivery agents - universities, local interest groups, churches, media, NGOs

Learner - tax payers, general public
CE goal - develop an understanding why government dollars should support an *Office of Energy Management* (establishment recommended by Energy Advisory Group)
CE content - form and function of *Office of Energy Management*
Delivery vehicle - advertisement, written flyer, public debate via broadcast media
Delivery agents - provincial government, NGOs

Learner - general public
CE goal - increase energy-use conservation
CE content - ways to achieve more energy efficiency and conservation
Delivery vehicle - printed material, workshops, energy audits, financial incentives
Delivery agents - *Office of Energy Management*, local interest groups

Learner - general public
CE goal - achieve energy-use efficiency, conservation, and alternatives
CE content - information about achieving energy-use efficiency, conservation, and alternatives; energy technology transfer
Delivery vehicle - printed information and description
Delivery agents - *Office of Energy Management*, local interest groups, NGOs

Learner - general public
CE goal - to achieve better comprehension of the roles of various federal and provincial departments in monitoring and enforcing environmental protection in Saskatchewan
CE content - easy-to-understand descriptions of existing laws, regulations, and policies concerning environment protection, and how these are implemented
Delivery vehicle - printed brochure or booklet, workshops
Delivery agents - federal and provincial governments, universities, local interest groups, libraries, NGOs

Learner - general public
CE goal - understand what mining sector has accomplished in environmental protection and reclamation
CE content - descriptions of what mining sector has accomplished in environmental protection and reclamation
Delivery vehicle - print brochure
Delivery agents - mining industry and related associations

Learner - general public
CE goal - achieve awareness of construction impacts on ecosystems
CE content - construction impacts on ecosystems
Delivery vehicle - broadcast and print media (feature stories, press releases)
Delivery agents - universities, technical colleges, extension services, local interest groups, NGOs

Learner - general public
CE goal - achieve better comprehension of resource mining and its ecological, social and economic impacts
CE content - descriptions of mining and its ecological, social and economic impacts
Delivery vehicle - printed brochure, public media debate, conferences, mine heritage site interpretation
Delivery agents - mining industry, universities, government, local interest groups

Learner - northern Saskatchewan residents
CE goal - encourage greater understanding of employment in mining industry
CE content - mining process training
Delivery vehicle - scholarships, workshops, courses, programs
Delivery agents - government, mining companies, universities, technical colleges

Learner - general public
CE goal - increase comprehension of the forest resources, the ecosystems in which they function, and the economies within which they are employed for human use
CE content - descriptions of forest resources, the ecosystems in which they function and the economies within which they are employed for human use
Delivery vehicle - written material, public forums
Delivery agents - universities, forest industry, government, NGOs

Learner - householders
CE goal - reduce householder impact on the environment
CE content - environmental issues and technological innovations awareness
Delivery vehicle - information exchange centre, demonstrations, speakers
Delivery agents - grocery chains, malls, NGOs, libraries

Learner - householders
CE goal - stimulate development of environmentally friendly products
CE content - describe the power of purchaser's choice to influence product development
Delivery vehicle - brochures, workshops, media, demonstrations, speakers
Delivery agents - universities, colleges, community education programs, local interest groups, NGOs, libraries

Learner - householders
CE goal - improved environmental and ecological literacy
CE content - introduction to ecology and ecological systems
Delivery vehicle - workshops, media descriptions, field trips
Delivery agents - universities, colleges, community education programs, local interest groups, libraries

Learner - householders
CE goal - approach 100% recycling
Impediments - need to adjust local economic structure to encourage and support recycling
CE content - environmental audit, how to recycle the array of recyclable products, how to live with only renewable resources in the home
Delivery vehicle - workshops, media, brochures, posters
Delivery agents - recycling industries, universities, colleges, libraries, local interest groups, NGOs

Learner - householders
CE goal - to invest time in natural environments and thus develop a protective attitude toward natural environments
CE content - where enjoyable environments are, what activities to do there, how to enjoy them
Delivery vehicle - guide books, media descriptions, guided interpretive walks
Delivery agents - private tour industries, universities, colleges, libraries, local interest groups, NGOs

Learner - householders
CE goal - achieve a higher rate of political activism
CE content - government administrative structure and process, how to influence government decision makers
Delivery vehicle - workshops
Delivery agents - universities, colleges, community education programs, local interest groups, NGOs

Learner - homeowners
CE goal - achieve more environmentally friendly house construction
CE content - environmental and economic advantages of passive solar construction and/or retrofitting, means of making basic improvements to your house
Delivery vehicle - workshops, books, media, energy audits
Delivery agents - construction industry, housing developers, universities, colleges, extension services, local interest groups, NGOs, energy efficiency industry

B. TOURISTS

Learner - tourists, campers, back-country users
CE goal - encourage greater awareness of and sensitivity to environmental and ecological impacts of human activity
CE content - site-specific ecological relationships, impacts of specific recreation activities, how to stop negative impacts
Delivery vehicle - brochures, interpretive programs
Delivery agents - government parks interpreters, local interest groups

C. VEHICLE OPERATORS

Learner - truck, bus and cab drivers
CE goal - achieve better fuel conservation
CE content - how to conserve fuel, information on more environmentally-friendly alternate fuels, importance of maintaining vehicle and engine efficiency
Delivery vehicle - workshops or seminars, fact sheets, energy audits
Delivery agents - fleet owners with a stake in cost and energy conservation, Saskatchewan Transportation Company, NGOs

Learner - student drivers
CE goal - achieve more environmentally friendly vehicle operation
CE content - even accelerator use, tire pressure, carburettor adjustments, reduced driving speeds, drive only on designated paved or gravel roads, purchase fuel-efficient vehicles, consider vehicle alternative for short-distance transportation near home, importance of maintaining vehicle engine efficiency
Delivery vehicle - written materials (in learners' handbook, or added to learner's permit test)
Delivery agents - Motor vehicle license issuers, private or school driver-trainers

Learner - current vehicle operators
CE goal - achieve more environmentally friendly vehicle operation, consider other transport modes
CE content - importance of maintaining vehicle and engine efficiency, tire pressures, carburettor adjustments, other transportation modes (public transit, highway bus, cycling, walking), alternate fuels and how to use them (vehicle modifications)
Delivery vehicle - broadcast media, print materials, workshops and seminars
Delivery agents - vehicle licence issuers, service stations (handouts), libraries, government

D. BUSINESS

Learner - tourism developers and promoters, ecotourism operators
CE goal - environmental and ecological literacy from a holistic perspective
CE content - introduction to ecological systems and their dynamics, what 'sustainable tourism' means
Delivery vehicle - workshops, conferences
Delivery agents - universities, colleges, community education programs, local interest groups, NGOs, economic development groups

Learner - business owners/operators, industry and government managers
CE goal - reliance on electronic information transfer rather than human travel
Impediments - front-end costs to purchase electronic equipment
CE content - environmental and economic advantages, equipment, installation, costs of electronic information transfer
Delivery vehicle - workshops and seminars, fact-sheets, broadcast media, articles and advertisements in management publications
Delivery agents - government cooperatively with telecommunications and electronics industries, information management companies

Learner - home builders, construction managers and workers
CE goal - awareness of environmentally friendly construction materials and processes
CE content - information about environmentally friendly materials and products, where to obtain them, demonstrations of environmentally friendly construction processes
Delivery vehicle - expositions, conferences, workshops, demonstration projects, print materials
Delivery agents - industry associations, colleges, universities, community education programs, local interest groups

Learner - construction managers
CE goal - achieve waste recycling
CE content - environmental auditing, better ways to manage construction waste
Delivery vehicle - workshops, conferences, print materials
Delivery agents - environmental auditors, colleges, universities, community education programs, local interest groups

Learner - engineers, construction managers
CE goal - protect ground water
CE content - ground water ecology, impacts of construction procedures on ground water, minimizing negative impacts
Delivery vehicle - workshops, conferences, print materials
Delivery agents - universities, colleges, community education programs

E. LAND USE MANAGERS AND DEVELOPERS

Learner - railway owners/operators
CE goal - stimulate idea exchange, greater awareness of railway right-of-way ecological health
CE content - toxic substances leaking and/or discharged from railway cars and engines, effects on soils, plants, water courses and ground water
Delivery vehicle - conferences, print materials
Delivery agents - universities cooperatively with government agencies and railway carriers

F. RESOURCE INDUSTRY MANAGERS AND EMPLOYEES

Learner - mining employees
CE goal - improved comprehension of ecosystems, impacts of mining activities on ecosystems
CE content - ecosystem and ecodynamics descriptions
Delivery vehicle - workshops, courses, conferences
Delivery agents - universities, colleges, mining companies

Learner - forest managers and forestry operators
CE goal - increased comprehension of forest ecosystems and ecodynamics
CE content - descriptions of forest ecosystems and ecodynamics
Delivery vehicle - workshops, courses, conference, print materials
Delivery agents - universities, colleges, forest industry companies

G. MANUFACTURERS

Learner - pipeline designers
CE goal - stimulate idea exchange about more environmentally safe pipeline construction, subsurface installation and leakage monitoring
CE content - most recent initiatives
Delivery vehicle - conferences
Delivery agents - universities cooperatively with government, pipeline manufacturers and installers

Learner - federal, provincial and municipal government employees
CE goal - reduce waste of paper, water, energy and other workplace resources
CE content - environmental audit, how to reduce waste
Delivery vehicle - in-service seminars, workshops, conventions
Delivery agents - universities, local interest groups, government-building management groups

Appendix E

Glossary of Terms

Biosphere - the outer portion of the earth -- air, water and soil -- where life is found.

CCME - Canadian Council of Ministers of the Environment

CCREM - Canadian Council of Resource and Environment Ministers (now CCME)

CMEC - Council of Ministers of Education, Canada

Conservation - ecology applied in a way to understand and manage the consequences of environmental activities as they impact on all forms of life, including humans

Continuing Education - see informal education

Development - modifying the biosphere and applying human, financial, living and non-living resources to satisfy human needs and improve the quality of their life

Ecology - interrelationships between living organisms and their environment

Ecosystem - an interrelated group of living species and their physical environment

Education - process of learning knowledge, skills and attitudes

Environment - all components of surroundings in which all living things exist and draw their sustenance

Environmental education - programs and activities to increase awareness, understanding and appreciation of the total environment and its interaction with human activities, including economic development

See also definition on page 9 of the Education Strategy for Sustainable Development.

Formal Education - education occurring as part of a course provided by an institution such as a school, college or university

FSIN - Federation of Saskatchewan Indian Nations

IEEP - International Environmental Education Program

Informal education - education occurring through the workplace, community action, media, independent reading or listening, or word-of-mouth

IUCN - International Union for the Conservation of Nature and Natural Resources

LEADS - League of Education Administrators and Directors of Saskatchewan

MLA - Member of the Legislative Assembly

NASSP - National Association of Secondary School Principals

NGO - non-government organization

NORTEP - Northern Teacher Education Program

Resource-based learning - a process whereby learners are actively interacting with a wide variety of print, non-print, facility, and human resources

SCRAD - Saskatchewan Committee on Rural Area Development

SEEDS - Society, Environment and Energy Development Studies Foundation

SIAST - Saskatchewan Institute of Applied Science and Technology

SOEEA - Saskatchewan Outdoor and Environmental Education Association

SSTA - Saskatchewan School Trustees' Association

SSTS - Saskatchewan Science Teachers' Society

STF - Saskatchewan Teachers' Federation

SUNTEP - Saskatchewan Urban Native Teacher Education Program

Sustainable development - using earth's resources to meet today's human needs without compromising the environment or resource availability for future generations' use

SWF - Saskatchewan Wildlife Federation

System - any interrelated set of elements organized around a purpose

Training - higher-level education to develop knowledge and skills to solve specialized problems

UNEP - United Nations Environment Program

UNESCO - United Nations Educational, Scientific and Cultural Organization

WWF - World Wildlife Fund

Appendix F

Acknowledgements

For their assistance and contributions, the Education Advisory Committee thanks many people.

Barry Bashutski
Director of Education and Research
Saskatchewan School Trustees Association
Regina

Jim Boa
President, Local 59 Inside Workers' Union
and Chairman, Environment Committee
Canadian Labour Congress

Jim Bogard, Director
Saskatchewan Tourism and Economic
Development, La Ronge

Derwyn Crozier-Smith, Executive Assistant
Saskatchewan Teachers' Federation
Saskatoon

Don Curran, Provincial Editor
Regina Leader Post
Regina

Kathy Dahl, Staff Development
Personnel Services Department
City of Saskatoon

Brian Goffin, Director
Northern Affairs Secretariat
La Ronge

Todd Hartsfield, Director
Saskatchewan Health
La Ronge

Yvonne Laitres, Administrative Officer
Saskatchewan Parks and Renewable
Resources, La Ronge

Susan Lamb, Public Programs Coordinator
Meewasin Valley Authority
Saskatoon

Harvey Linnen, Public Affairs Director
Saskatchewan Environment and Public
Safety, Regina

Ray McKay, Executive Director
Saskatchewan Education - Northern
Division, La Ronge

Dr. R. Neal
Saskatoon Environmental Advisory Council
Saskatoon

Ken Pontikes, Director
Planning and Development
City of Saskatoon

Martin Sterling, Saskatchewan Coordinator
Global Education Project
Saskatoon

Norm Stevenson, Program Director
Federation of Saskatchewan Indian Nations
Saskatoon

Kate Waygood, Councillor
City of Saskatoon

Appendix G

Recommended Readings

Barnaby, Frank (editor). (1988). The Gaia Peace Atlas. Doubleday. ISBN 0-385-24180-9 or 0-385-2491-7.

Buetler, L.J. (1988). "Environmental Education: Making the Future More Promising". NASSP Curriculum Report, 17(3), January.

Durrell, Lee. (1986). State of the Ark. Doubleday. ISBN 0-385-23667-0 or 0-385-23668-9.

Hart, E.P. (1981). "Identification of Key Characteristics of Environmental Education". Journal of Environmental Education 13(1), pp 15 - 19.

Jonker, Peter (editor). (1992). Saskatchewan's Endangered Species: An Introduction. University of Saskatchewan, Extension Division. Saskatoon.

Knowles, Malcolm S. (1980). The Modern Practice of Adult Education: From Pedagogy to Androgogy. New York: Cambridge.

Knox, A.B. (1987). "Reducing Barriers to Participation in Continuing Education". Lifelong Learning: An Omnibus of Practice and Research, 10(5), pp 7 - 9.

Meadows, Donella H. United Nations Educational Programme. Harvesting One Hundredfold: Key Concepts and Case Studies in EE. Paris: UNESCO.

Myers, Norman (editor). (1984). Gaia, An Atlas of Planet Management. Doubleday. ISBN 0-385-19071-9 or 0-385-19072-7.

North American Association for Environmental Education. (1990). Essential Learnings in Environmental Education. Troy, OH: author.

Orr, David W. (1990). "Is Conservation Education an Oxymoron?" Conservation Education 4(2), pp 119 - 121.

Owen, O.S. (1985). Natural Resource Conservation. An Ecological Approach. (4th ed.) Toronto, ON: MacMillan of Canada.

Rowe, J. Stan. (1991). Education for a New World View. Unpublished paper. 13pp mimeo.

Saskatchewan Education. (1984). Directions: The Final Report Curriculum and Instruction Review. Regina SK: author.

Saskatchewan Education; Saskatchewan Outdoor and Environmental Education Association. (1991). Out to Learn: Guidelines and Standards for Outdoor Environmental Education. (2nd edition). Regina SK: author.

Saskatchewan Education. (1985). Toward the Year 2000. Future Directions in Curriculum and Instruction. Curriculum and Instruction Review Minister's Advisory Committee. Regina SK: author.

Thomas, Alan M. (1991). Beyond Education: A New Perspective on Society's Management of Learning. San Francisco: Oxford Jossey-Bass Publishers.

Wisconsin Department of Public Instruction. (1985). A Guide to Curriculum Planning in Environmental Education. Madison, WI: author.

World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press.